LISTING OF CLAIMS

This listing of claims will replace all prior versions and listings of claims in this application:

1. (Original) A subband forming apparatus, comprising:

a plurality of memory locations with each memory location being configured to store at least a regional signal corresponding to a divided portion of an input signal; and

a plurality of analytic filter banks configured to perform a parallel subband analysis relative to the regional signals stored in the plurality of memory locations, with each analytic filter bank being coupled in a one-to-one relationship with each memory location and a particular regional signal stored therein and configured to receive the particular regional signal and then to divide each received particular regional signal into a plurality of subbands,

wherein each of said plurality of memory locations also stores at least one signal in addition to the stored regional signal, said at least one signal including a copy of at least one of a leading portion and trailing portion of another regional signal stored in another memory location corresponding to a divided portion of the input signal originally bordering the divided portion of the input signal corresponding to the particular regional signal.

2. (Original) The apparatus as defined in Claim 1, wherein said copy is a copy of the leading portion of said another regional signal.

3. (Original) The apparatus as defined in Claim 1, wherein said copy is a copy of the trailing portion of said another regional signal.

4. (Original) The apparatus as defined in Claim 1, wherein at least one of said plurality memory locations is configured to store copies of both the leading portion and the trailing portion of said another regional signal.

5. (Original) The apparatus as defined in Claim 1, wherein at least one of said plurality memory locations is configured to also store at least one of two reverse-mirrored signals copied from a leading portion and a trailing portion of the particular regional signal stored therein as part of the at least one signal.

6. (Original) The apparatus as defined in Claim 2, wherein at least one of said plurality memory locations is configured to also store a reverse-mirrored signal copied from a leading portion of the particular regional signal stored therein as part of the at least one signal.

7. (Original) The apparatus as defined in Claim 3, wherein at least one of said plurality memory locations is configured to also store a reverse-mirrored signal copied from a trailing portion of the particular regional signal stored therein as part of the at least one signal.

8. (Original) A wavelet conversion apparatus, comprising at least two of the subband forming apparatuses according to Claim 1, and configured to execute data conversion operations in horizontal and vertical directions.

9. (Original) A wavelet conversion apparatus, comprising at least two of the subband forming apparatuses according to Claim 2, and configured to execute data conversion operations in horizontal and vertical directions.

10. (Original) A wavelet conversion apparatus, comprising at least two of the subband forming apparatuses according to Claim 3, and configured to execute data conversion operations in horizontal and vertical directions.

11. (Original) A wavelet conversion apparatus, comprising at least two of the subband forming apparatuses according to Claim 4, and configured to execute data conversion operations in horizontal and vertical directions.

12. (Original) A wavelet conversion apparatus, comprising at least two of the subband forming apparatuses according to Claim 5, and configured to execute data conversion operations in horizontal and vertical directions.

13. (Original) A wavelet conversion apparatus, comprising at least two of the subband forming apparatuses according to Claim 6, and configured to execute data conversion operations in horizontal and vertical directions.

14. (Currently Amended) A wavelet conversion apparatus, comprising at least two of the subband forming apparatuses according to Claim 7, and configured to execute data conversion operations in horizontal and vertical directions.

15. (Currently Amended) A subband synthesizing apparatus, comprising:

a plurality of memory locations each configured to store an input subband-analyzed signal having subband components along with at least one other signal; and

a plurality of synthesizing filter banks, each synthesizing filter bank being configured to receive the subband-analyzed signal and the at least one other signal from a corresponding memory location to which each synthesizing filter bank is coupled in a one-to-one relationship so that the plurality of synthesizing filter banks together perform parallel synthesizing to form a synthesized signal,

wherein the at least one other signal includes a copy of at least one of a leading portion and trailing portion of another subband-analyzed signal stored in another memory location.

[[0]] 16. (Currently Amended) The apparatus as defined in Claim 15, wherein at least one of said plurality of memory locations is configured to also store at least one of two reverse-mirrored signals copied from leading and trailing portions of the subband-analyzed signal stored therein as a part of said at least one other signal.

17. (Original) A wavelet reverse conversion apparatus, comprising at least two of the subband synthesizing apparatuses according to Claim 15 and configured to execute data conversion operations in horizontal and vertical directions.

18. (Currently Amended) A subband forming apparatus, comprising:

a plurality of memory means for individually storing a divided part of an input signal as a plurality of separate regional signals; and

a plurality of analytic filter bank means, each of the analytic filter bank means being coupled in a one-to-one relationship with one of said plurality of memory means ~~and the plurality of analytic filter bank means~~, said plurality of analytic filter bank means analyzing in parallel said plurality of regional signals, wherein each of said plurality of analytic filter bank means accesses only a corresponding memory means out of said plurality of memory means to receive a corresponding regional signal,

wherein each of said plurality of memory means stores said corresponding regional signal along with a signal copied from at least one of a leading portion and trailing portion of another regional signal stored in another memory location.

19. (Original) The apparatus as defined in Claim 18, wherein at least one of said plurality of memory means additionally stores a copy of at least one of reverse-mirrored signals from leading and trailing portions of the stored corresponding regional signal.

20. (Original) A wavelet conversion apparatus, comprising at least two of the subband forming apparatuses according to Claim 18 for executing data conversion operations in horizontal and vertical directions.

21. (Original) The apparatus as defined in Claim 19, wherein at least one of said plurality of memory means additionally stores a copy of at least one of reverse-mirrored signals from leading and trailing portions of the stored corresponding regional signal.

22. (Original) A subband synthesizing apparatus, comprising:

a plurality of memory means for storing an input subband-analyzed signal having at least two subband components along with at least one other signal; and

a plurality of synthetic filter bank means, each of said synthetic filter bank means being coupled in a one-to-one relationship with each one of said plurality of memory means to receive corresponding subband-analyzed signals for synthesizing in parallel to provide a sythesized signal,

wherein said at least one other signal includes a copy of at least one of a leading portion and a trailing portion of a subband-analyzed signal stored in another memory means.

23. (Original) The apparatus as defined in Claim 22, wherein at least one of said plurality of memory means also stores at least one of two reverse-mirrored signals copied from leading and trailing portions of the stored corresponding subband-analyzed signal stored therein as a part of said at least one other signal.

24. (Original) A wavelet reverse conversion apparatus, comprising at least two of the subband synthesizing apparatuses according to Claim 22 for executing data conversion operations in horizontal and vertical directions.

25. (Original) A wavelet reverse conversion apparatus, comprising at least two of the subband synthesizing apparatuses according to Claim 23 for executing data conversion operations in horizontal and vertical directions.

26. (Original) A subband forming method, comprising the steps of:

separating an input signal into a plurality of regional signals;

storing said regional signals in different memory locations along with at least one signal copied from a leading portion or a trailing portion of another regional signal separated from the input signal and stored at another memory location; and

performing parallel subband analytic operations relative to said regional signals using each regional signal from each memory location as one branch of said parallel subband analytic operations.

27. (Original) The method as defined in Claim 26, wherein said storing step additionally stores at least one of two reverse-mirrored signals copied from leading and trailing portions of the stored regional signal.

28. (Original) A wavelet conversion method, comprising the step of providing at least two of the subband forming apparatuses according to Claim 18 for executing data conversion operations respectively in horizontal and vertical directions.

29. (Original) A wavelet conversion method, comprising the step of providing at least two of the subband forming apparatuses according to Claim 19 for executing data conversion operations respectively in horizontal and vertical directions.

30. (Original) A subband synthesizing method comprising the steps of:

storing an input subband-analyzed signal as analyzed subband regional signals in a plurality of separate memory locations along with signals copied from at least one of leading and trailing portions of an analyzed subband regional signal stored in another memory location; and

accessing said analyzed subband regional signals from the plurality of separate memory locations and performing subband synthesis operations as parallel separate operations relative to each of the accessed analyzed subband regional signals.

31. (Original) The method as defined in Claim 30, wherein said storing step additionally stores at least one of two reverse-mirrored signals copied from leading and trailing portions of the analyzed subband regional signal also stored at the same memory location.

32. (Original) A wavelet reverse conversion method, comprising the step of providing at least two of the subband sythesizing apparatuses according to Claim 22 for executing data conversion operations respectively in horizontal and vertical directions.

33. (Original) A wavelet reverse conversion method, comprising the step of providing at least two of the subband synthesizing apparatuses according to Claim 23 for executing data conversion operations respectively in horizontal and vertical directions.

34. (Original) A data coding apparatus, comprising:

a wavelet converter configured to convert a two-dimension signal with a wavelet conversion and outputting wavelet coefficients;

a region divider configured to perform a regional division in which said wavelet conversion coefficients are divided into a plurality of coefficient groups in accordance with conditions such that coefficients existing in a spatial location are sorted into a corresponding group; and

a plurality of coders configured to code in parallel said wavelet conversion coefficients divided into said plurality of coefficient groups.

35. (Original) The apparatus as defined in Claim 34, wherein said plurality of coders respectively add information of said spatial location relative to each output coded signal.

36. (Original) A data decoding apparatus, comprising:

a plurality of decoders configured to perform parallel decoding operations relative to coded signals separated into a plurality of coefficient groups, said coded signals being generated through a regional division in which wavelet conversion coefficients of a two-dimension signal are divided into a plurality of coefficient groups in accordance with conditions such that coefficients existing in a spatial location are sorted into a corresponding group and in which said wavelet conversion coefficients divided in said plurality of coefficient groups are respectively coded;

a region synthesizer configured to perform a region synthesizing operation, corresponding to said regional division, in which said wavelet conversion coefficients in said plurality of coefficient groups are synthesized and outputting a set of wavelet conversion coefficients; and

a wavelet reverse converter for performing a wavelet reverse conversion relative to said set of wavelet conversion coefficients.

37. (Original) The apparatus as defined in Claim 36, wherein said coded signals in a plurality of coefficient groups input to said plurality of decoders contain information of spatial locations relative to the wavelet conversion coefficients divided in the respective regions and said region synthesizer uses said information of spatial locations during said region synthesizing operation.

38. (Original) A data coding apparatus, comprising:

wavelet converting means for converting a two-dimension signal with a wavelet conversion and outputting wavelet coefficients;

region dividing means for performing a regional division in which said wavelet conversion coefficients are divided into a plurality of coefficient groups in accordance with conditions such that coefficients existing in a spatial location are sorted into a corresponding group; and

a plurality of coding means for coding in parallel said wavelet conversion coefficients divided in said plurality of coefficient groups.

39. (Original) The apparatus as defined in Claim 38, wherein said plurality of coding means respectively add information of said spatial location relative to each output coded signal.

40. (Original) A data decoding apparatus, comprising:

plurality of decoding means for performing in parallel decoding operations relative to coded signals separated in a plurality of coefficient groups, said coded signals being generated through a regional division in which wavelet conversion coefficients of a two-dimension signal are divided into a plurality of coefficient groups in accordance with conditions such that coefficients existing in a spatial location are sorted into a corresponding group and in which said wavelet conversion coefficients divided in said plurality of coefficient groups are respectively coded;

region synthesizing means for performing a region synthesizing operation, corresponding to said regional division, in which said wavelet conversion coefficients in said plurality of coefficient groups are synthesized and outputting a set of wavelet conversion coefficients; and

wavelet reverse converting means for performing a wavelet reverse conversion relative to said set of wavelet conversion coefficients.

41. (Original) The apparatus as defined in Claim 40, wherein said coded signals in a plurality of coefficient groups input to said plurality of decoding means contain information of spatial locations relative to the wavelet conversion coefficients divided into the respective regions and said region synthesizing means uses said information of spatial locations during said region synthesizing operation.

42. (Original) A data coding method, comprising the steps of:

converting a two-dimension signal with a wavelet conversion;

outputting wavelet coefficients;

performing a regional division in which said wavelet conversion coefficients are divided into a plurality of coefficient groups in accordance with conditions such

that coefficients existing in a spatial location are sorted into a corresponding group; and

coding in parallel said wavelet conversion coefficients divided into said plurality of coefficient groups.

43. (Currently Amended) A data decoding method, comprising the steps of:

performing in parallel decoding operations relative to coded signals separated in a plurality of coefficient groups, said coded signals being generated through a regional division in which wavelet conversion coefficients of two-dimension signal are divided into a plurality of coefficient groups in accordance with conditions such that coefficients existing in a spatial location are sorted into a corresponding group and in which said wavelet conversion coefficients divided into said plurality of coefficient groups are respectively coded;

executing a region synthesizing operation, corresponding to said regional division, in which said wavelet conversion coefficients in said plurality of coefficient groups are synthesized[[.]]

outputting a set of wavelet conversion coefficients; and

carrying out a wavelet reverse conversion relative to said set of wavelet conversion coefficients.

IN THE DRAWINGS

The attached sheet of drawing includes changes to Fig. 25. This sheet, which includes Fig. 25, replaces the original sheet.

Attachment: Replacement Sheet